

WE CLAIM:

1. A method of turning cases of goods moving in a direction of case travel on a conveyor system comprising:

providing a case moving in the direction of case travel at a first speed;

propelling in the direction of case travel a turning device in a path of the case at a speed less than the first speed;

contacting the case with the turning device while the turning device is moving in the direction of case travel at a speed less than the first speed; and

pushing against the case with the turning device to cause the case to turn about an axis normal to the direction of case travel.
2. The method of claim 1 further comprising:

propelling the turning device in a direction opposite the direction of case travel after the turning device first contacts the case and while the turning device is pushing against the case to assist in turning the case.
3. The method of claim 2 wherein:

the case is first moved on an infeed conveyor, and the first speed is the speed of the infeed conveyor; and

after moving on the infeed conveyor, the case is moved on a spacing conveyor at a second speed greater than the first speed.

4. The method of claim 3 further comprising:

contacting a second case with the first case while the first case is turning and pushing against the second case with the first case whereby the second case turns simultaneously with and in response to the turning of the first case.

5. A method of turning cases of goods moving in a direction of case travel on a conveyor system about an axis normal to the direction of case travel, the method comprising:

propelling the cases in the direction of case travel with the longitudinal dimension of the case perpendicular to the direction of case travel;

contacting only a first case with a turning device, the turning device pushing against and temporarily slowing the movement of a first end of the first case in the direction of case travel, while permitting a second end of the first case to move more rapidly than the first end in the direction of case travel to cause the first case to turn;

contacting a second case with the first case and pushing against the second case with the first case whereby the second case turns simultaneously with and in response to the turning of the first case.

6. The method of claim 5 wherein:

the cases are propelled on a first conveyor section at a first speed, then propelled on a second conveyor section at a second speed greater than the first speed whereby a space between successive cases is increased, and then propelled on a third conveyor section at a third speed less than the second speed.

7. The method of claim 6 wherein the third speed is greater than or equal to the first speed.

8. The method of claim 5 wherein contacting a first case with a turning device further comprises contacting a first case with a turning device while the turning device is moving in the direction of case travel.

9. The method of claim 8 wherein contacting a first case with a turning device further comprises moving the turning device in a direction opposite the direction of case travel while the first case is turning and the turning device is in contact with the first case.

10. A palletizing machine for arranging cases of goods in a patterned layer and then stacking the patterned layers one on top of another to form a load, the palletizing machine comprising:

a conveyor system upon which the cases move in a direction of case travel;

a turning device movable from a first vertical position above the cases on the conveyor system to a second vertical position wherein the turning device will collide with a case traveling in-line with the turning device, the turning device movable between the first vertical position and the second vertical position to collide with selective cases causing the selective cases to turn around an axis normal to the direction of case travel;

first actuating means for moving the turning device between the first vertical position and the second vertical position;

the turning device also being movable between a first position and a second position spaced from the first position in the direction of case travel; and

a second actuating means for moving the turning device between the first position and the second position.

11. The palletizing machine of claim 10 wherein the conveyor system further comprises:

an infeed conveyor propelling the cases at a first speed;

a spacing conveyor propelling the cases at a second speed greater than the first speed; and

a third conveyor section after the spacing conveyor propelling the cases at a third speed less than the second speed, wherein the cases collide with the turning device while on the third conveyor section.

12. A method of turning cases of goods moving in direction of case travel on a conveyor system about an axis normal to the direction of case travel, the method comprising:

providing a case moving in the direction of case travel;

contacting the case with a turning device while the turning device is stationary or moving in the direction of case travel;

pushing against the case with the turning device to cause the case to turn about an axis normal to the direction of case travel while the turning device is moving in a direction opposite the direction of case travel.

13. A method of turning cases of goods on a palletizer moving in a direction of case travel on a conveyor system about an axis normal to the direction of case travel, the method comprising:

propelling a first case and a second case in close proximity to one another along a conveyor system in the direction of case travel with the longitudinal dimension of each case generally perpendicular to the direction of case travel;

turning the first case and the second case approximately simultaneously about an axis normal to the direction of case travel to a new orientation where the longitudinal dimension of each case is generally parallel to the direction of case travel and the first case and the second case are in close proximity to one another;

wherein at least at some point in time during the turning of the first case and the second case, the first case is in contact with the second case and pushes against the second case whereby the second case turns in response to the turning of the first case; and

propelling the first case and the second case in close proximity to one another in the direction of case travel with the longitudinal dimension of each case generally parallel to the direction of case travel to an area of the conveyor system where the first and the second case are assembled along with other cases into a patterned layer of cases to form a load.